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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,577	12/03/2001	Steven M. Lefkowitz	10980852-1	8145

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AGILENT TECHNOLOGIES, INC.  
Legal Department, DL429  
Intellectual Property Administration  
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EXAMINER

FORMAN, BETTY J

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 11/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/005,577

Applicant(s)

LEFKOWITZ ET AL.

Examiner

BJ Forman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 31,33-40,42-49 and 51-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31,33-40,42-49 and 51-57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____  | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Status of the Claims***

1. This action is in response to papers filed 13 September 2004 in which claims 31, 33, 35, 40, 43, 48 and 49 were amended, claim 50 was canceled and claims 53-57 were added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 17 June 2004 are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed but are deemed moot in view of the amendments, withdrawn rejections and new grounds for rejection. New grounds for rejection, necessitated by amendment, are discussed.

Claims 31, 33-40, 42-49 and 51-57 are under prosecution.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 31, 34-37, 39, 49, 52-54 and 56 are rejected under 35 U.S.C. 102(a) as being anticipate by Chabreck et al (U.S. Patent No. 6,586,038, filed 27 October 2000).

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Regarding Claim 31, Chabreck et al disclose a process for preparing a solids support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (Column 3, lines 21-65), contacting the surface reactive groups with a plurality of monomers, polymerizing the monomers to produce a solid support having a surface-tethered polymer having at least one absorbing moiety (e.g. amine) covalently linked to the surface coating (Column 7, lines 35-59) and linking a biomolecule to the polymer via the absorbing moiety (i.e. surface contact between the hydrophilic segment of a polymer-coated surface and a biological surface e.g. contact lens-to-eye contact or implant-to-implant site contact (Column 2, lines 51-65).

The instantly claimed "linking" is given its broadest reasonable interpretation in view of the claims and specification wherein in "linking" is undefined. Given the broadest reasonable interpretation, the hydrophilic interaction taught by Novartis is encompassed by the instantly claimed linking.

Regarding Claim 34, Chabreck et al disclose the polymer is "substantially" linear i.e. brush-type structure (Column 1, lines 1-14).

Regarding Claim 35, Chabreck et al disclose a process for preparing a solids support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (Column 3, lines 21-65), contacting the surface reactive groups with a plurality of monomers, polymerizing the monomers to produce a solid support having a surface-tethered polymer having at least one adsorbing moiety (e.g. amine) covalently linked to the surface coating wherein the polymer is a vinyl polymer (Column 7, lines 35-59).

Regarding Claim 36, Chabreck et al disclose the adsorbing moiety is an amine (e.g. amine, (Column 9, lines 4-44).

Regarding Claim 37, Chabreck et al disclose the polymer is poly vinyl amine (Column 9, lines 4-44).

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Regarding Claim 39, Chabreck et al disclose the method wherein a plurality of polymers are polymerized i.e. surface coated polymer brushes (abstract).

Regarding Claim 49, Chabreck et al disclose a process for preparing a solids support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (Column 3, lines 21-65), contacting the surface reactive groups with a plurality of vinyl monomers and polymerizing the monomers to produce a solid support having a surface-tethered vinyl polymer covalently linked to the surface and having at least one adsorbing moiety (Column 7, lines 35-59) for adsorbing a biomolecule moiety (i.e. surface contact between the polymer-coated surface and a biological surface e.g. contact lens-to-eye contact or implant-to-implant site contact)(Column 2, lines 51-65).

Regarding Claim 52, Chabreck et al disclose the adsorbing moiety is a poly vinyl amine (Column 9, lines 4-44).

Regarding Claim 53, Chabreck et al disclose a method for preparing a solid support comprising contacting a plurality of vinyl monomers with a reactive hydroxyl, carboxyl, amino or thiol group present on the surface of a solid support and polymerizing the monomer to produce a support having vinyl polymer covalently linked to the support (Column 3, lines 21-65 and Column 7, lines 35-59).

Regarding Claim 54, Chabreck et al disclose the method further comprising linking a biomolecule to the vinyl polymer i.e. hydrophilic interaction between the surface coating and biological surface (Column 2, lines 51-65).

Regarding Claim 56, Chabreck et al disclose a method for preparing a solid support comprising contacting a plurality of monomers with a reactive hydroxyl, carboxyl, amino or thiol group present on the surface of a solid support and polymerizing the monomers to produce a support polymer comprising a reactive group e.g. amine (Column 3, lines 21-65 and Column 7, lines 35-59) and linking a biomolecule to the reactive group i.e. hydrophilic segment (Column 2, lines 51-65).

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4. Claims 31, 34-37, 39, 49, 52-54 and 56 are rejected under 35 U.S.C. 102(a) as being anticipated by Novartis (EA 1 095 711 A2, published 5 February 2001).

Regarding Claim 31, Novartis discloses a process for preparing a solids support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (§ 14-17), contacting the surface reactive groups with a plurality of monomers, polymerizing the monomers to produce a solid support having a surface-tethered polymer having at least one absorbing moiety (e.g. amine, § 37) covalently linked to the surface coating (e.g. § 30-43) and linking a biomolecule to the polymer via the absorbing moiety (i.e. surface contact between the hydrophilic segment of a polymer-coated surface and a biological surface e.g. contact lens-to-eye contact or implant-to-implant site contact (§ 8-10).

The instantly claimed "linking" is given its broadest reasonable interpretation in view of the claims and specification wherein "linking" is undefined. Given the broadest reasonable interpretation, the hydrophilic interaction taught by Novartis is encompassed by the instantly claimed linking.

Regarding Claim 34, Novartis discloses the polymer is "substantially" linear i.e. brush-type structure (§ 41).

Regarding Claim 35, Novartis discloses a process for preparing a solids support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (§ 14-17), contacting the surface reactive groups with a plurality of monomers, polymerizing the monomers to produce a solid support having a surface-tethered polymer having at least one adsorbing moiety (e.g. amine, § 37) covalently linked to the surface coating (e.g. § 30-43) wherein the polymer is a vinyl polymer (§ 32-39).

Regarding Claim 36, Novartis discloses the adsorbing moiety is an amine (e.g. amine, § 37, 56-58 and 108).

Regarding Claim 37, Novartis discloses the polymer is poly vinyl amine (§ 32-39).

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Regarding Claim 39, Novartis discloses the method wherein a plurality of polymers are polymerized i.e. surface coated polymer brushes (abstract).

Regarding Claim 49, Novartis discloses a process for preparing a solids support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (§ 14-17), contacting the surface reactive groups with a plurality of vinyl monomers and polymerizing the monomers to produce a solid support having a surface-tethered vinyl polymer covalently linked to the surface and having at least one adsorbing moiety (e.g. § 30-43) for adsorbing a biomolecule moiety (i.e. surface contact between the polymer-coated surface and a biological surface e.g. contact lens-to-eye contact or implant-to-implant site contact (§ 8-10).

Regarding Claim 52, Novartis discloses the adsorbing moiety is a poly vinyl amine (e.g. amine, § 37, 56-58 and 108).

Regarding Claim 53, Novartis discloses a method for preparing a solid support comprising contacting a plurality of vinyl monomers with a reactive hydroxyl, carboxyl, amino or thiol group present on the surface of a solid support and polymerizing the monomer to produce a support having vinyl polymer covalently linked to the support (§ 25-43).

Regarding Claim 54, Novartis discloses the method further comprising linking a biomolecule to the vinyl polymer i.e. hydrophilic interaction between the surface coating and biological surface (§ 8-10).

Regarding Claim 56, Novartis discloses a method for preparing a solid support comprising contacting a plurality of monomers with a reactive hydroxyl, carboxyl, amino or thiol group present on the surface of a solid support and polymerizing the monomers to produce a support polymer comprising a reactive group e.g. amine (§ 25-43) and linking a biomolecule to the reactive group i.e. hydrophilic segment (§ 8-10).

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***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 33, 38, 40, 42-48, 55 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novartis (EA 1 095 711 A2, published 5 February 2001) or Chabreck et al (U.S. Patent No. 6,586,038, filed 27 October 2000) in view of Klaerner et al (U.S. Patent Application Publication No. 2002/0001845, filed 24 June 2001).

Regarding Claims 33, 38, 40-48, 55 and 57, Novartis discloses a process for preparing a solid support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (§ 14-17), contacting the surface reactive groups with a plurality of monomers, polymerizing the monomers to produce a solid support having a surface-tethered polymer having at least one absorbing moiety (e.g. amine, § 37) covalently linked to the surface coating (e.g. § 30-43) and linking a biomolecule to the polymer via the absorbing moiety (i.e. surface contact between the polymer-coated surface and a biological surface e.g. contact lens-to-eye contact or implant-to-implant site contact (§ 8-10). Novartis further teaches their surface has biosensor applications (§ 10, lines 4-7) but they are silent regarding the biosensor linking moiety (Claim 33); the biosensor for linking an oligonucleotide, polynucleotide or probe molecule (Claims 38, 40, 42-48, 55 and 57).

However, Klaerner et al teach a similar biological polymer brush sensor and process comprising providing a solid support comprising a surface coating having a reactive site (e.g. surface hydroxyls § 79 or initiator comprising hydroxyl, carboxyl, amino or thiol (§ 73-76 and § 92), contacting the surface coating with a plurality of monomers (§ 124 and Example 1 & 2: § 217 and 220), and polymerizing the monomers to produce a solid support having a surface



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tethered polymer covalently linked to the surface coating, said polymer having at least one adsorbing moiety for non-covalent attachment of a biomolecule (§ 123, especially, lines 10-15) wherein a portion of the biomolecule is an exogenous linking moiety (i.e. chemical hook, § 138) and wherein the biomolecule comprises an oligonucleotide or polynucleotide (§ 135-138).

Klaerner et al further teach the polymer brush sensors provide controlled architecture that permit tuning concentration and accessibility of the attached probes thereby tuning sensitivity of the sensor as desired (§ 2). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the probes of Klaerner et al to the sensors of Novartis based on the suggestion of Novartis to do so and further based on the advantages taught by Klaerner et al i.e. the polymer brush sensors provide controlled architecture that permit tuning concentration and accessibility of the attached probes thereby tuning sensitivity of the sensor as desired (§ 2).

7. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Novartis (EA 1 095 711 A2, published 5 February 2001) or Chabreck et al (U.S. Patent No. 6,586,038, filed 27 October 2000) in view of Mitsuhashi (U.S. Patent No. 5,206,132, filed 3 May 1991).

Regarding Claim 51, Novartis discloses a process for preparing a solid support comprising, providing a solid support comprising a surface coating having a surface reactive hydroxyl, carboxyl, amino or thiol group (§ 14-17), contacting the surface reactive groups with a plurality of monomers, polymerizing the monomers to produce a solid support having a surface-tethered polymer having at least one absorbing moiety (e.g. amine, § 37) covalently linked to the surface coating (e.g. § 30-43) and linking a biomolecule to the polymer via the absorbing moiety (i.e. surface contact between the polymer-coated surface and a biological surface e.g. contact lens-to-eye contact or implant-to-implant site contact (§ 8-10).

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Novartis further teaches their surface has biosensor applications (§ 10, lines 4-7) but they are silent regarding cerium as a polymerization reactant. However, it was well known in the vinyl polymerization art that the presence of cerium in the polymerization improves properties of the coating layer (Column 6, lines 30-41). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the cerium taught by Mitsuhashi to the polymerizations of Novartis and Chabreck for the expected benefit of improved coating layer as taught by Mitsuhashi (Column 6, lines 30-41).

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

#### **Conclusion**

9. NO claim is allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (571) 272-0745. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.



BJ Forman, Ph.D.  
Primary Examiner  
Art Unit: 1634  
November 22, 2004